Sissejuhatus infotehnoloogiasse

Loengu ülevaade

1972-1980: mikroprotsessoritest personaalarvutiteni

- Esimesed arvutimängud
- Email, ethernet ja muu võrguvärk
- Esimesed ise-kokkupandavad mikroarvutid
- Miniarvutite tarkvara: Unix, C, ..., Smalltalk, Prolog
- Mikroarvutite tarkvara: CP/M, PL/1 ja BASIC kloonid
- Personaalarvutite teke: Commodore PET, Apple II, Radio Shack
- Microsoft ja BASIC
- Visicalc
- Xerox ALTO
- Usenet

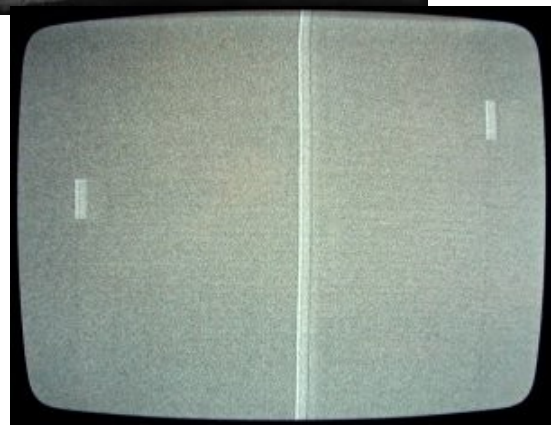
...1972...

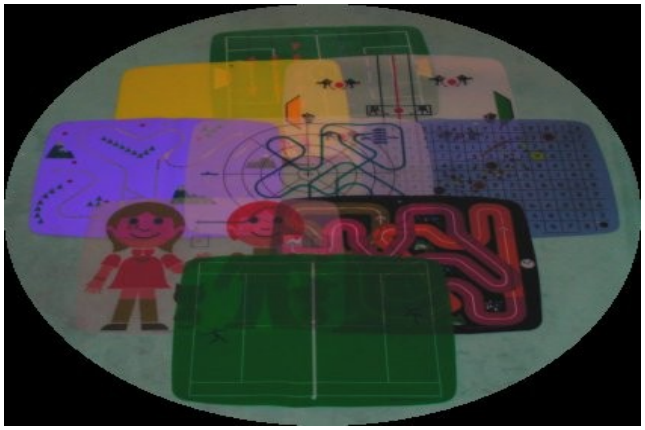
- **Some gaming stuff:**
  - **Space war** was a first graphical computer game, created on PDP-1 in 1961.
  - In 1970, an engineer called Ralph Baer created the game called *Computer Space* based on *Space War*.
  - Nolan Bushnell tried to make an arcade version of *Space War* and created *Computer Space*. Nutting Associates bought the game, hired Nolan and manufactured 1,500 *Space War* machines. The game was not a success because people found it difficult to play.
- **As Nolan felt he didn't receive enough pay, he created his own company: Atari in 1972.**
- **Atari** ships **Pong**, one of the first really successful commercial video games.
- **In 1977 Atari enters the home computer market among others**

...1972 ...

- **Magnavox Odyssey: first home video game along**

- **No processor: combined analog/digital**
- Plastic overlays on TV screen to get a background picture
- over 80,000 Odyssey and over 20,000 rifle packs sold in 1972
- Altogether, ca 350,000 made





1972: Colossal Cave: a text-based adventure game

- **Written by Will Crowther**: Will worked on developing the assembly language program for the original routers used in creating the ARPAnet. In their spare time the Crowthers, both avid cavers, explored and mapped portions of the Mammoth and Flint Ridge cave systems in Kentucky for the Cave Research Foundation.
- **Crowther wrote a computer simulation based on the maps, for a Digital Equipment Corporation PDP-10 computer, in FORTRAN**. His first version included caver jargon, and many of the names of rooms in this version came from actual features in the caves Will had been exploring.
- Unfortunately, **it was during this period that Crowther's marriage ended. Feeling estranged from his two daughters and wanting to be closer to them, he decided to write a program that they might enjoy.**
- Crowther's daughters enjoyed the game, and **it was passed from friend to friend during the early days of the Internet**, appearing on countless computers on and off the fledgling network.

What happened later with Colossal Cave

- **In 1976, Don Woods** was working at Stanford University's Stanford Artificial Intelligence Lab, otherwise known by the acronym SAIL. Woods found a copy of Crowther's rudimentary program left on one of the SAIL computers by some unknown Johnny Appleseed, so to speak.
- **He contacted Crowther by the simple expedient of sending email to "crowther@*sitename*," where *sitename* was every computer then on the Internet, only a mere handful of sites at the time**. After corresponding with Crowther and getting his blessings, Woods greatly expanded the program.
- Influenced by Tolkien's writing, **Woods added touches such as a troll, elves, and a volcano.**
- **Jim Gillogly** at the Rand Corporation spent several weeks in 1976 porting the code (with Woods' and Crowther's blessings) **from the original FORTRAN source into C for UNIX**. Most UNIX systems run successors of this C version. **Gillogly later ported the code to Heathkit and then IBM-PC personal computers** with the help of Walt Bilofsky, founder of The Software Toolworks (which was eventually renamed Mindscape). This version was marketed in 1981 under the name "The Original Adventure."

...1972

- Canada's Automatic Electronic Systems introduces the world's **first programmable word processor with a video screen**, the AES 90. The computer system uses magnetic disks for storage, and a custom-built microprocessor.
- **Gary Kildall** implements **PL/I** on the Intel 4004 processor.
- The People's Computer Company is founded.
- **Bill Gates and Paul Allen** form the **Traf-O-Data** company.
- Traf-O-Data develops a primitive microcomputer based on Intel's 8008 microprocessor for recording automobile traffic flow on a highway.
- **5 1/4 inch diskettes** first appear.
- Xerox decides to build a personal computer to be used for research. **Project "Alto" begins**.

1972

- **In 1971 Ray Tomlinson** of BBN **invents email program** to send messages across a distributed network.
- In 1972 Ray Tomlinson modifies **email program for ARPANET** where it becomes a quick hit. The @ sign was chosen from the punctuation keys on Tomlinson's Model 33 Teletype for its "at" meaning
- **First computer-to-computer chat takes place at UCLA**, and is repeated during ICCC, as psychotic PARRY (at Stanford) discusses its problems with the Doctor (at BBN)

1972

- **Two important programming concepts introduced:**
  - **The first object-oriented language Smalltalk** developed at XEROX PARC, bsaed on ideas by Alana Kay.
  - **The first logic programming language Prolog** developed by Alan Colmerauer at University of Marseilles

1973...

- Intel files a patent application for a "memory system for a multichip digital computer".
- The first prototype Alto workstation computer is turned on at Xerox' Palo Alto Research Center. Its first screen display is a bitmapped image of the Sesame Street character Cookie Monster.
- The first operational Alto computer is completed at Xerox PARC.
- Traf-O-Data shuts down. It made about US$20,000.
- Design work is completed on the Micral, the first non-kit computer based on a microprocessor (the Intel 8008). Built in France, the Micral is advertised in the U.S., but is not successful there.
- The term "microcomputer" first appears in print, in reference to the Micral.

1972

- **Hewlett-Packard introduces a programmable calculator** with a magnetic stripe memory for storing programs
- Users could write programs up to 100 lines in length and record them on blank cards, or they could buy pre-programmed cards.
- In 1975 it is used on Soyuz-Apollo mission for calculating critical course-correction maneuvers

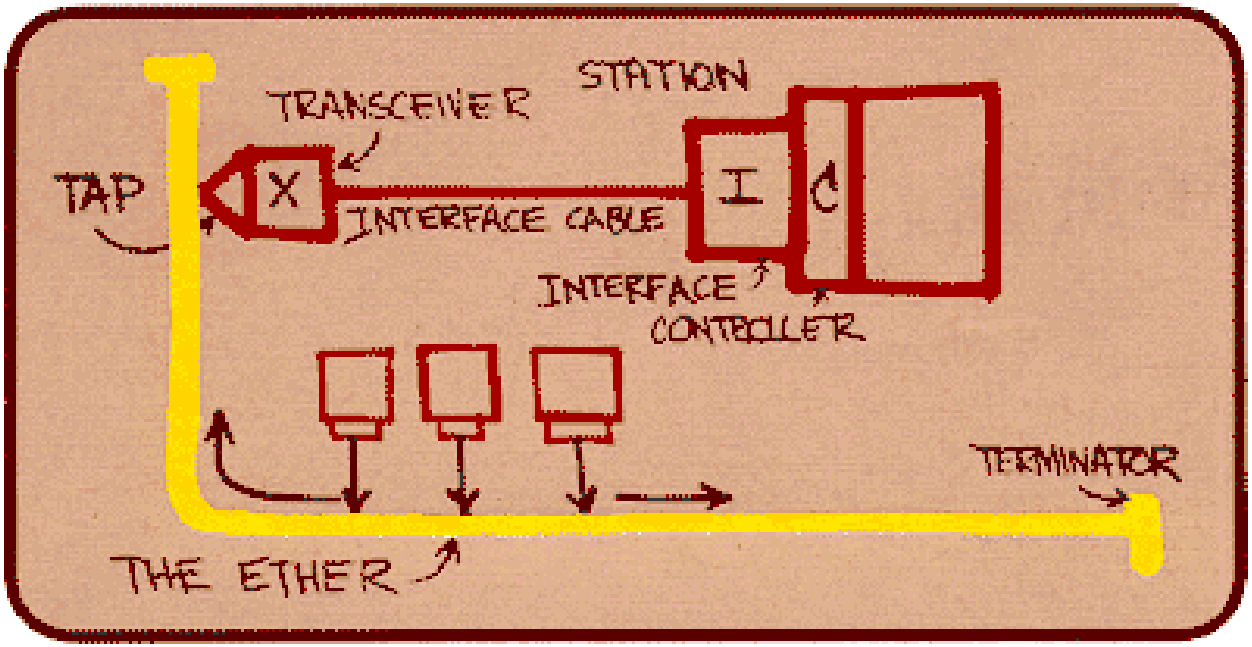
...1973...

- Gary Kildall writes a simple operating system in his PL/M language. He calls it **CP/M** (Control Program/Monitor).
- **Stephen Wozniak** joins Hewlett-Packard.
- Gary Kildall creates PL/M for the Intel 8008, based on PL/I.

- IBM develops a cheap disk and drive.
- IBM introduces the IBM 3340 hard disk unit, known as the **Winchester**, IBM's internal development code name. The recording head rides on a layer of air 18 millionths of an inch thick. It uses four 8-inch diameter platters, giving it a capacity of 70 MB.

...1973

- Gary Kildall begins consulting work at Intel.
- Scelbi Computer Consulting Company offers **the first computer kit in the U.S. using a microprocessor**, the Intel 8008-based Scelbi-8H, for US$565, with 1KB programmable memory. An additional 15KB is available for US$2760.
- **Bob Metcalfe** invents the **Ethernet** connectivity system.



1974...

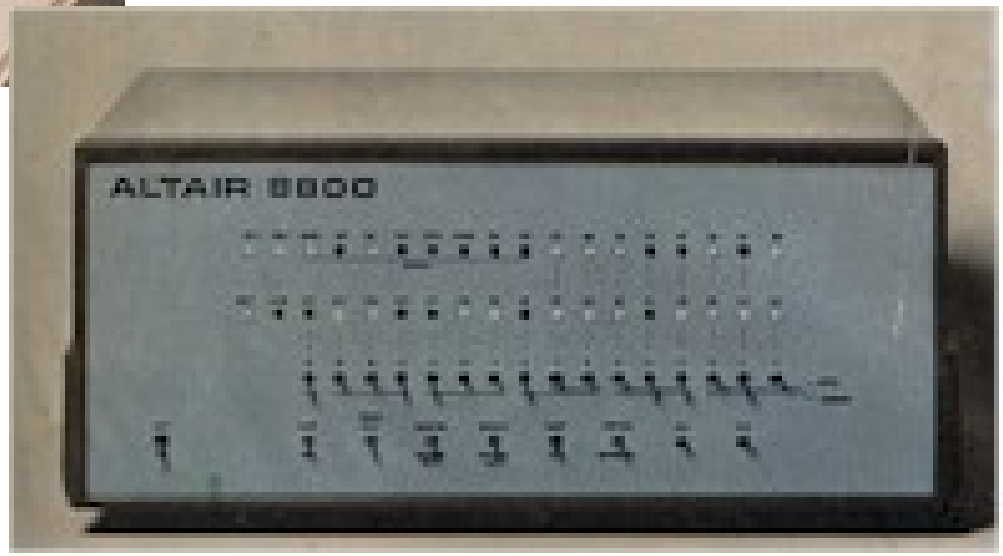
- Intel releases its **2-MHz 8080 chip, an 8-bit microprocessor**. It can access 64KB of memory. It uses 6000 transistors, based on 6-micron technology. Speed is 0.64 MIPS.
- In a desperate act to save his failing calculator company, **MITS** company owner Ed Roberts begins building a small computer based on Intel's new 8080 chip, with plans to sell it for the unheard-of price of US$500.
- **MITS** completes the first prototype **Altair 8800 microcomputer.**

- Bravo is developed for the Xerox Alto computer. It is **the first WYSIWYG program for a personal computer**.

Altair

- Altair was one of the first **successfully sold personal computer kits** for do-it-yourself computing fans. No monitor, no keyboard

- Keyboard and cassette drive can be added
- Oscilloscope can be attached to be used as a display



...1974...

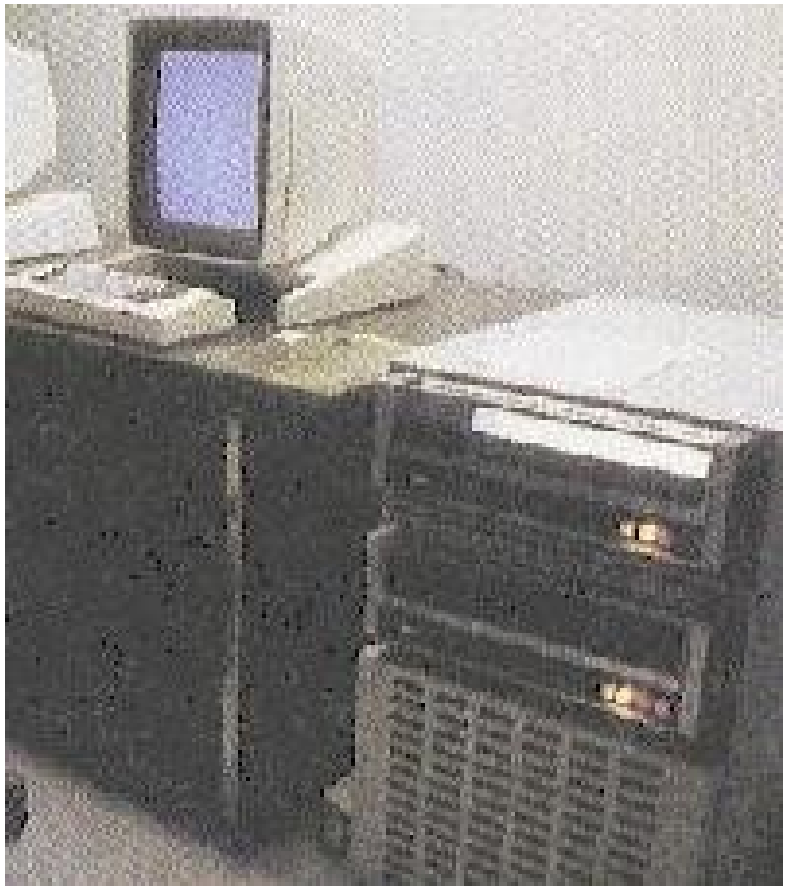
- Railway Express loses Ed Robert's only prototype Altair computer, en route to New York for review and photography for publishing by Popular Electronics.
- Les Solomon, publisher of Popular Electronics, receives Altair number 0001.
- Lauren Solomon, 12 year old daughter of Les Solomon, publisher of Popular Electronics, suggests the name "**Altair**" for Ed Robert's new microcomputer. Altair was the name of where Star Trek's Enterprise was going that night on TV.
- **Popular Electronics publishes an article by MITS announcing the Altair 8800 computer for US$439 in kit form**. It uses the Intel 8080 processor. The Altair pictured on the cover of the magazine is actually a mock-up, as an actual computer was not available.
- Paul Allen sees the Popular Electronics issue with the Altair, and tells Bill Gates that the microcomputer revolution is just beginning.

...1974

- Gary Kildall, of Microcomputer Applications Associates, develops the **CP/M operating system for Intel 8080-based systems**.
- **Motorola** introduces its **6800 chip**, an early 8-bit microprocessor used in microcomputers and industrial and automotive control devices. The 6800 was designed by Chuck Peddle and Charlie Melear.
- Brian Kernighan and Dennis Ritchie develop the **C programming language**.
- RCA releases the 1802 processor, running at a blazing 6.4 MHz. It is considered **one of the first RISC chips**. It is used on a variety of devices, from video games to NASA space probes.
- Engineer David Ahl suggests Digital Equipment produce an inexpensive version of its PDP-8 minicomputer, for US$5000. Top management call the idea foolish.
- Gary Kildall and John Torode begin selling the CP/M disk operating system for microcomputers.

...1974: Alto

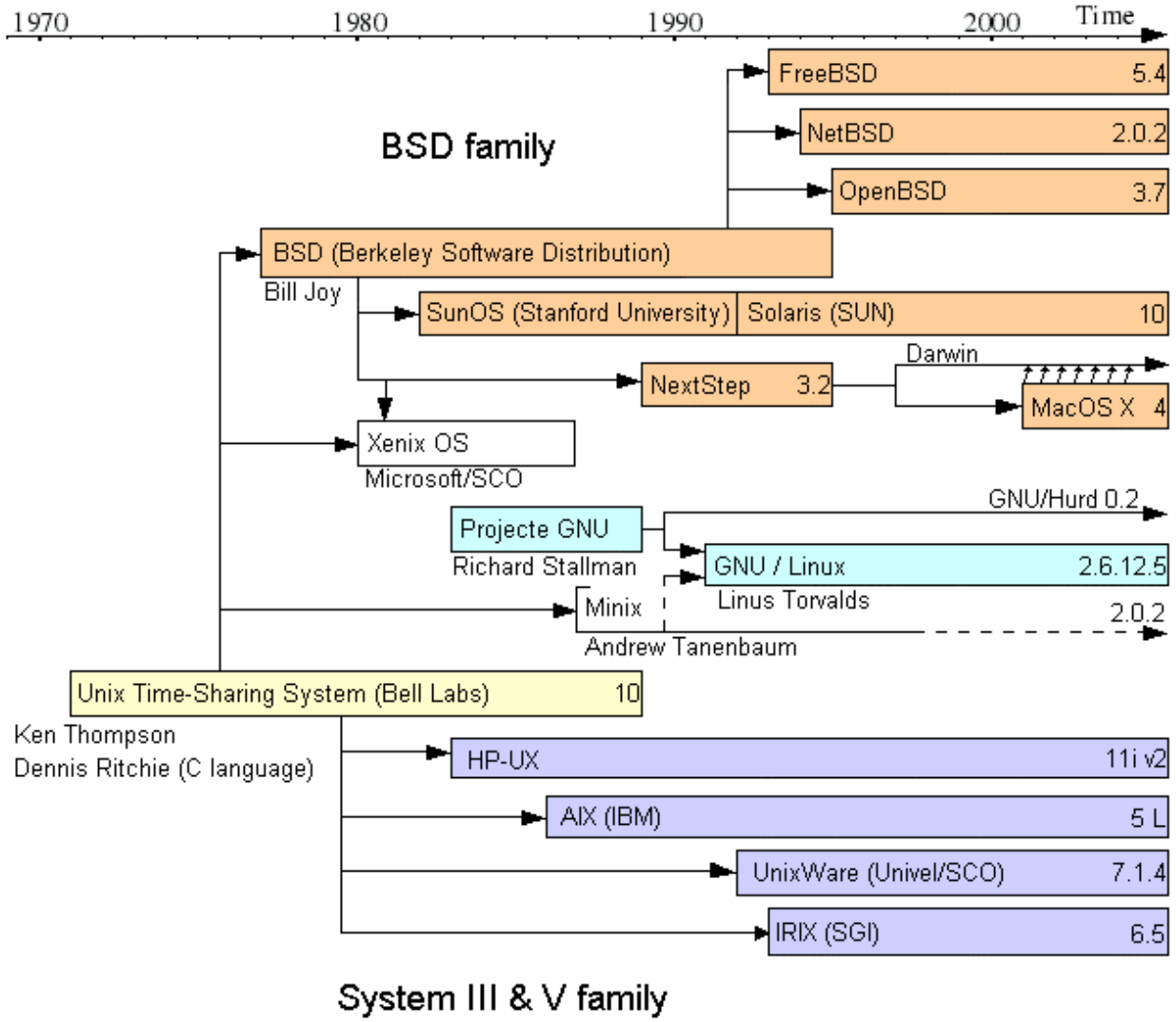
- **Xerox releases the Alto computer**.



- **A personal computer to be used for research**
- Cost: $32,000
- Never produced for profit
- **First serious machine to feature a modern user interface**: windows, mouse, etc invented by Engelbart in 1964
- Great influence on Macintosh
- Great influence on Microsoft

...recall: birth of UNIX 69-71

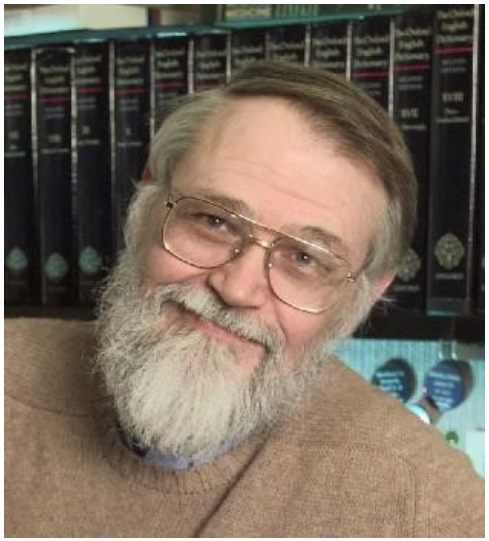
- 69-71
- PDP 7 and 11
- Ken Thompson,
- Dennis Ritchie



- Gory details: see http://www.levenez.com/unix/

C language: first half of 70s

- **Influences/derivation history: from ALGOL to C**
  - **ALGOL** 58/60: Hoare, Perlis, Dijkstra, Kurtz, ..., Kotli,...
  - BCPL derivative of ALGOL (Strachey)
  - B simplified derivative of BCPL (Ken Thompson)
  - **C** derivative of B (Dennis & Ritchie)
- **C development 1969-1973**
- **Famous C book 1978 " The C Programming Language"**
- **Thompson, Ritchie, Kernighan:**



1975

- Paul Allen meets with Ed Roberts to demonstrate the newly written BASIC interpreter for the Altair. Despite never having touched an Altair before, the BASIC works flawlessly.

- **Bill Gates and Paul Allen license their newly written BASIC to MITS**, their first customer. This is the first computer language program written for a personal computer.

- The **Xerox PARC**-developed Gypsy word-processing system is first field-tested by end-users. **Gypsy is one of the first word processors termed "WYSIWYG**", meaning what you see is what you get. Gypsy runs on the PARC-developed Alto personal computer.

1975

- Fred Moore and Gordon French hold the first meeting of a **new microcomputer hobbyist's club** in French's garage, in Menlo Park, California. 32 people meet, including Bob Albrect, Steve Dompier, Lee Felsenstein, Bob Marsh, Tom Pittman, Marty Spergel, Alan Baum, and **Steven Wozniak**. Bob Albrect shows off an Altair, and Steve Dompier reports on MITS, and how they had 4000 orders for the Altair.
- Stephen Dorsey, founder of Automatic Electronic Systems, sells his 25% of the company for $135,000.
- The second meeting of Fred Moore/Gordon French's computer hobbyists group is held at the Stanford AI lab. 40 attend. The name for the group is chosen: Bay Area Amateur Computer Users Group - **Homebrew Computer Club**.

1975

- Bill Gates and Paul Allen found **Micro-Soft** (the hyphen is later dropped).
- MITS delivers the first generally-available **Altair 8800, sold for US$375** with 1KB memory.
- MOS Technology announces the MC6501 at US$20 and the **MC6502 at US$25**. At this point, the Intel 8080 costs about US$150.
- Bob Marsh delivers the first Processor Technology 4KB memory boards for the Altair.
- At Xerox, John Ellenby proposes they build the **Alto II**, a modified Alto, making it easier to produce, more reliable, and more easily maintained. His request is approved.
- Bill Gates and Paul Allen sign **a licensing agreement with MITS**, for their implementation of the BASIC language.
- Bill Gates and Paul Allen ship 4K and 8K version of **BASIC v2.0**.
- Dick Heiser opens Arrow Head Computer Company, subtitled "The Computer Store", in Los Angeles, selling assembled Altairs, boards, peripherals, and magazines. **This is the first retail computer store in the USA**.

1975

- Micom Data Systems ships its first product, the Micom 2000 word processing computer.
- (summer) IMSAI announces the **IMSAI 8080** microcomputer.
- IBM's Entry Level Systems unit unveils "**Project Mercury**", the IBM 5100 Portable Computer. It is a briefcase-size minicomputer with BASIC, 16KB RAM, tape storage, and built-in 5-inch screen. Price: US$9000. Weight: 55 pounds. (Price over US$10,000)
- The first issue of **Byte** magazine is published.
- MITS releases a version of **MicroSoft BASIC 2.0** for its Altair 8800, in 4K and 8K editions.
- Paul Terrell opens the Byte Shop, in Mountain View, California, one of the first computer stores in the US.
- Bill Gates writes **an open letter** to microcomputer hobbyists, complaining about software piracy, to be published in an Altair newsletter.
- Lee Felsenstein and Bob Marsh **begin work on a complete computer**, 8080-based with a keyboard and color video display capabilities built-in.

1975

- To date, MITS has sold **2,000 Altair 8800** systems.
- Wavemate releases the Jupiter II computer kit.
- Southwest Technical Products releases the M6800 computer kit.
- Canadian microchip maker Microsystems International shuts down, after accumulating losses of over $50 million.
- IBM's John Cocke begins work on project "801", to develop a scaleable chip design that could be used in small computers as well as large.
- **Zilog** is founded.
- MITS begins work on a Motorola 6800-based Altair.
- MITS sales of Altair computers hits **US$1 million**.
- Sphere Corporation introduces its Sphere I computer kit, featuring a Motorola 6800 CPU, 4KB RAM, ROM monitor, keyboard, and video interface, for US$650.
- Cromemco is founded, by Harry Garland and Roger Melen. The company is named after the Crowthers Memorial dorm at Stanford.

1976

- David Bunnell publishes in his Altair newsletter an open letter from Bill Gates to the microcomputer hobbyists, complaining of software piracy.
- Bill Gates writes software routines for BASIC on the **Altair to use diskettes** for storage.
- Steve Wozniak and Steve Jobs finish work on a computer circuit board, that they call the **Apple I** computer
- By the end of its first year in business, Micom Data Systems ships 180 Micom 2000 computers, worth $2 million.
- Paul Terrell incorporates **Byte, Inc**
- Intel introduces the 5-MHz **8085 microprocessor**. Speed is 0.37 MIPS. It uses 6500 transistors, based on 3-micron technology. It supports an 8-bit bus. Operates on a single 5-volt power supply. (1978)
- Bill Gates writes a **second open letter** to computer hobbyists, condemning software piracy. Again it is published in the Altair newsletter.
- Microsoft hires its **first employee**, Marc McDonald.

1976

- **National Semiconductor** releases the SC/MP 8-bit microprocessor, providing early advanced multiprocessing.
- **Digital Research copyrights CP/M**, its industry-standard microcomputer operating system, created by company founder Gary Kildall.
- Texas Instruments introduces the TMS9900, **the first 16-bit microprocessor**. The microprocessor implemented Texas Instrument's 16-bit architecture on the TI 990 minicomputer.
- **Wang Laboratories** announces a word-processing system using advanced computer technology, rather than traditional electromechanical devices. The price is **US$30,000**, more than twice that of the most expensive competitor's word-processor.

1976

- **Steve Jobs and Steve Wozniak** form the **Apple Computer Company**, on April Fool's Day.
- The **Apple I computer board is sold in kit form**, and delivered to stores by Steve Jobs and Steve Wozniak. Price: US$666.66.
- Paul Terrell orders **50 Apple computers** from Steve Jobs, for his Byte Shop.

1976

- Zilog releases the **2.5-MHz Z80**, an 8-bit microprocessor whose instruction set is a superset of the Intel 8080.
- Micom Data Systems ships its first product, the Micom 2000 word processing computer.
- Paul Terrell receives his order for 50 Apple computers.
- iCOM advertises their "Frugal Floppy" in BYTE magazine, an **8-inch floppy drive, selling for US$1200**.
- Several computer hobbyist clubs hold their first convention at the Personal Computing Festival, in Atlantic City, New Jersey.
- Steve Wozniak **begins work on the Apple II**.
- **Computer Shack** is incorporated. The name is later changed to ComputerLand, due to objections from Radio Shack. (ComputerLand is incorporated)

1976

- Commodore International buys MOS Technology.
- **Mike Markkula**, ex-marketing wizard at Intel, visits Steve Jobs' garage, to see the Apple computers.
- **Steve Wozniak decides to remain at Hewlett-Packard, but is soon convinced that he should leave and join Apple Computer permanently.**
- The tradename "**Microsoft**" is registered.
- ComputerLand opens a pilot store in Hayward, California, as a retail outlet and a training facility for franchise owners.
- Paul Allen resigns from MITS.
- **Paul Allen joins Microsoft full time**
- **Bill Gates drops out of Harvard**, to devote his full attention to Microsoft.

1976

- Don French and Steve Leininger are given official approval to develop and sell a **microcomputer for Radio Shack**.
- Steve Wozniak and Randy Wigginton demonstrate the **first prototype Apple II** at a Homebrew Computer Club meeting.
- To date, MITS has shipped over **10,000 Altair 8800 kits**.
- Hewlett-Packard begins Project Capricorn, to build **a computer-like calculator**.
- At Xerox, the Display Word Processing Task Force recommends that Xerox produce an office information system like the Alto. Code name for the project is Janus.
- Advanced Micro Devices and Intel **sign a patent cross-license agreement**, giving Advanced Micro Devices the right to copy Intel's processor microcode and instruction codes.

1976

- Xerox management rejects two proposals to market the Alto computer.
- Fairchild introduces the Channel F, the **first programmable (via plug-in cartridges) home video game system**. Price: US$170
- At Xerox, John Ellenby proposes they build the Alto III, to be marketed as an advanced word processing system. The proposal is shelved.
- Processor Technology releases VDM, a video display module. It works on the Altair, IMSAI, Sol, Polymorphic computers, and any other with an S-100 bus.
- Dynalogic of Canada creates its own advanced microcomputer.
- **Gary Kildall founds Intergalactic Digital Research**.
- Gary Kildall grants a license to CP/M to GNAT Computers for US$90.
- Gary Kildall grants a license to CP/M to IMSAI for US$25,000.
- Kentucky Fried Computers is founded.

1976

- John Martin sells Bill Millard on the idea of a chain of computer stores. Bill promises John shares in the company in exchange for the idea. The chain later becomes ComputerLand.
- **U.S. Robotics** is founded, in Skokie, Illinois
- MOS Technology ships the **6502 microprocessor**. The 6502 was developed by Chuck Peddle.
- MOS Technology Inc. announces the KIM-1 Microcomputer System, with 1-MHz 6502 CPU, 1KB RAM, 2KB ROM monitor, 23-key keypad, LED readout, cassette and serial interfaces, for US$245.
- Chuck Peddle designs the **Commodore PET**.
- MITS unveils the **Altair 680**, based on the Motorola 6800 microprocessor.
- Steve Wozniak proposes that Hewlett-Packard create a personal computer. Steve Jobs proposes the same to Atari. **Both are rejected**.

1976

- **Warner Communications buys Atari from Nolan Bushnell for US$26 million**.
- The first issue of Dr. Dobbs is published
- IMSAI begins shipping the IMSAI 8080.
- Polymorphic Systems introduces the Poly morphic 8800. It is the first microcomputer with an interface for a video monitor, a connection for a cassette tape recorder, and its basic operating system in ROM
- **Cray Research introduces the Cray-1** vector-processing computer.

- **Bill Joy writes “vi”: a simple visual text editor for UNIX.**
- Vi is a follow-up to the line editors ed and em
- **Joy later became**:
  - Main author of the Berkeley UNIX (BSD) version
  - One of the founders of Sun Microsystems
  - One the main authors of Java

1977

- The **Commodore PET** (Personal Electronic Transactor) -- the first of several personal computers released in 1977 -- came fully assembled and was straightforward to operate.

1977

- The **Apple II** became an instant success when released in 1977 with its printed circuit motherboard, switching power supply, keyboard, case assembly, manual, game paddles, A/C powercord, and cassette tape with the computer game "Breakout.“

1977

- In the first month after its release, **Tandy Radio Shack's** first desktop computer -- the **TRS-80** -- sold 10,000 units, well more than the company's projected sales of 3,000 units for one year.

1977

- The **Apple Computer Company** is incorporated.
- Apple employees move into an office on Stevens Creek Boulevard in Cupertino, California.
- A working model of the first Radio Shack computer is demonstrated to company president, Charles Tandy.
- Commodore first shows a prototype PET computer at the Winter Consumer Electronics Show.
- Apple Computer moves from Jobs' garage to an office in Cupertino.
- Bill Gates and Paul Allen sign a partnership agreement to officially create the **Microsoft** company.

1977

- Commodore Business Machines Inc. shows its PET 2001 computer at the West Coast Computer Faire. The PET includes a 6502 CPU, 4KB RAM, 14KB ROM, keyboard, display, and tape drive, for US$600.
- Apple Computer introduces the Apple II at the West Coast Computer Faire. The computer features a 6502 CPU, 4KB RAM, 16KB ROM, keyboard, 8-slot motherboard, game paddles, graphics/text interface to color display, and built-in BASIC, for US$1300. It is the first personal computer with color graphics
- Apple Computer delivers its first Apple II system.

May-August

- 10 months after its introduction, 175 Apple I kits have sold.
- **Pertec buys MITS and the Altair line for US$6 million in stock**.
- Microsoft ships "Microsoft FORTRAN" for CP/M-based computers
- Radio Shack (a division of Tandy Corp.) announces the TRS-80 microcomputer, with Z80 CPU, 4KB RAM, 4KB ROM, keyboard, black-and-white video display, and tape cassette for US$600.

1977

September

- One month after launching the TRS-80, 10,000 are sold, despite sales projections of only 3,000 in the first year.

November

- Apple Computer releases Applesoft, a version of BASIC with floating-point capabilities. It is licensed from Microsoft
- Heath Schlumber Company introduces its first microcomputer kit, the H-8 personal computer kit, based on the Intel 8080.

December

- At an executive board meeting at Apple Computer, president Mike Markkula lists the floppy disk drive as the company's top goal.
- Steve Wozniak writes the floppy disk controller software for use with the Apple II.

1977

- Dan Bricklin conceives the idea for the VisiCalc spreadsheet program.
- IMSAI licenses use of CP/M for its microcomputers for US$25,000.
- Atari introduces the Atari Video Computer System (VCS), later renamed the Atari 2600.

1978

- **The VAX 11/780 from Digital Equipment Corp**. featured the ability to address up to 4.3 gigabytes of virtual memory, providing hundreds of times the capacity of most minicomputers.

- **The 5 1/4-inch floppy disk** became the standard medium for personal computer software after Apple Computer and Tandy Radio Shack introduced disk drives for this format.

1978

January

- **Apple Computer demonstrates its first working prototype Apple II disk drive** at the Consumer Electronics Show, in Las Vegas.

May

- Intel begins production of the 8086 microprocessor. It is created by two engineers in just three weeks. Work on the processor began when it was realized that the i432 project was in trouble.

June

- **Intel introduces the 4.77-MHz 8086 microprocessor**. It uses 16-bit registers, a 16-bit data bus, and 29,000 transistors, using 3-micron technology. Price is US$360. It can access 1 MB of memory. Speed is 0.33 MIPS. Later speeds included 8-MHz (0.66 MIPS) and 10-MHz.
- Microsoft ships Microsoft COBOL.
- Apple Computer introduces the Disk II, a 5.25 inch floppy disk drive linked to the Apple II by cable. Price: US$495, including controller card.
- **Pertec ceases production of the Altair.**

1978

August-December

- MicroPro introduces WordMaster.
- Digital Equipment opens a retail store in a shopping mall, for selling small computer systems priced below US$10,000.
- Epson announces the MX-80 dot matrix printer, which established a new standard in high performance with low price for printers.
- Atari announces the Atari 400 and 800 personal computers, using the 6502 microprocessor.
- **Microsoft's sales for the year reach US$1 million.**
- (early) Dan Bricklin completes a BASIC program demonstrating his proposed spreadsheet application.
- (summer) Apple Computer hires Chuck Peddle, designer of the 6502 microprocessor and Commodore's PET.
- (fall) Personal Software company software publisher Dan Fylstra loans an Apple II to Dan Bricklin to create his spreadsheet program.
- (fall) Microsoft begins developing BASIC for the Intel 8086 processor.

1978

- Apple Computer begins work on a supercomputer with a bit-sliced architecture, code-named **Lisa**.
- Taito releases the Space Invaders game to arcade centers.
- Bally begins shipping its Bally Professional Arcade game.
- Cinematronics releases Space Wars to arcades.
- IBM scientist John Cocke produces the 801 computer, a RISC prototype named after the laboratory building it was built in.
- Tandy opens its first dedicated computer center.
- Apple Computer begins research and development on what would become the Lisa.
- Xerox donates 50 Alto computers to Stanford, Carnegie-Mellon, and MIT.
- Hermann Hauser founds Acorn Computers, in England.

1979

- Harvard MBA candidate Daniel Bricklin and programmer Robert Frankston developed VisiCalc, the program that made a business machine of the personal computer, for the Apple II.

1979

- The Motorola 68000 microprocessor exhibited a processing speed far greater than its contemporaries.
- In development since 1967, the Stanford Cart successfully crossed a chair-filled room without human intervention in 1979.
- California Institute of Technology professor Carver Mead and Xerox Corp. computer scientist Lynn Conway wrote a manual of chip design, "Introduction to VLSI Systems."

January

- Xerox president replies to John Ellenby's proposal to market the Alto, turning down his proposal.
- Microsoft moves its offices from Albuquerque, New Mexico to Bellevue, Washington.
- Taito first shows the Space Invaders game, in Japan.

May

- Software Arts demonstrates VisiCalc at the 4th West Coast Computer Faire. Dan Bricklin and Bob Frankston wrote it during 1978-79, under the company name Software Arts, under contract to Personal Software.

1979

- Apple Computer introduces the **Apple II Plus**, with 48KB memory, for US$1195.
- Apple Computer introduces its first printer, the Apple Silentype, for US$600. It is a Trendcom Model 200, released under the Apple name.
- Intel introduces the **4.77-MHz 8088 microprocessor**. It was created as a stepping stone to the 8086, as it operates on 16 bits internally, but supports an 8-bit data bus, to use existing 8-bit device-controlling chips. It contains 29,000 transistors, using 3-micron technology, and can address 1MB of memory. Speed is 0.33 MIPS. A later version operates at 8-MHz, for a speed of 0.75 MIPS.
- Bob Metcalfe founds **3Com** Corporation.
- Texas Instruments introduces the TI-99/4 personal computer, for an initial price of US$1500. It uses the TI 9940 16-bit microprocessor.
- MicroPro releases the **WordStar** word processor, written by Rob Barnaby. It is made available for Intel 8080A Zilog Z-80 based CP/M-80 systems. written by Seymour Rubenstein
- Microsoft announces Microsoft BASIC 8086 at the National Computer Conference.]

1979

- **July**
- CompuServe begins a service to computer hobbyists called MicroNET, offering bulletin boards, databases, and games.
- Clive Sinclair creates Sinclair Research.
- **August**
- Microsoft releases its Assembler language for 8080/Z80 microprocessors.
- Wayne Ratliff develops the Vulcan database program (Ashton-Tate later markets it as **dBase II**).
- **September**
- **Motorola's 68000 16-bit microprocessor appears**. It uses 68,000 transistors, giving it its name.
- **October**
- 2.5 years after the introduction of the Apple II, 50,000 units have been sold.
- Personal Software releases VisiCalc for the Apple II, for US$100.

1979

- Atari begins shipping the Atari 400 and Atari 800 personal computers. The 400 comes with 8KB, selling for US$550. The 800 sells for US$1000.
- Radio Shack begins shipping the TRS-80 Model II to users.

November

- Xerox Office Products Division president, Don Massaro, decides to champion the Star office system (based on the Alto).
- Texas Instruments begins shipping the TI 99/4.

December

- **A group of Apple Computer engineers and executives is given a demo of Xerox Palo Alto Research Center's Alto computer system, in exchange for Xerox buying 100,000 Apple Computer shares for US$1 million.**
- Atari develops the Asteroids computer game.
- Microsoft completes work on BASIC for the Intel 8086 processor.
- The first Comdex show is held, in Las Vegas. Approximately 150 companies show products to some 4,000 visitors.

1979

- Microsoft begins developing an 8086 version of FORTRAN.
- Apple Computer's Trip Hawkins negotiates a deal with Dan Fylstra of Personal Software to buy his company and VisiCalc for US$1 million in Apple stock. Apple's president refuses to approve the deal.
- **Ross Perot** asks Bill Gates about buying Microsoft. Gates recalls asking US$6-15 million. Perot recalls Gates asking US$40-60 million.
- Alan Shugart founds Seagate Technologies (hard disk maker), in Scotts Valley,
- Apple Computer begins work on "Sara", the code name for what will be the Apple III.
- Apple Computer releases the word processing program AppleWriter 1.0.
- Schlumberger Ltd. sells Heath Company to Zenith Radio Corp. for US$64.5 million.
- Automated Simulations releases **Temple of Apshai** for microcomputers.
- Niklaus Wirth invents the **Modula-1** programming language.
- NEC releases its NEC PC 8001 microcomputer in Japan, the first for that country.

1979

- Xerox shows its Alto personal computer in TV commercials.
- After airing a TV commercial for the Alto several times, Xerox decides not to market the Alto.

79-80: USENET : varane “web” : tekstiuudised

- USENET on hiiglaslik kogus uudisgruppe. Tekstid liiguvad masinast masinasse.
- **USENET**: Unix Users Network founded **late 1979.**
- Info liikus algselt: **UUCP** protolli abil (Unix to Unix communications protocol, enamasti moodemi abil sissehelistamisega).
- **V7 Unix with UUCP**. Two Duke University grad students in North Carolina, Tom Truscott and Jim Ellis, thought of hooking computers together to exchange information with the Unix community. Steve Bellovin, a grad student at the University of North Carolina, put together the first version of the news software using shell scripts and installed it on the first two sites: "unc" and "duke." At the beginning of 1980 the network consisted of those two sites and "phs" (another machine at Duke), and was described at the January Usenix conference.
- **1986 murrang**: Network News Transfer Protocol (**NNTP**) . Uudised liiguvad TCP/IP (interneti) kaudu.